SLEET.

Pike's Peak, Colorado, 1st.
Fort Buford, Dakota, 26th.
Chicago, Illinois, 30th.
Dubuque, Iowa, 20th.
Des Moines, Iowa, 27th.
Detroit, Michigan, 4th.
Grand Haven, Michigan, 4th, 20th.
Escanaba, Michigan, 19th, 20th, 31st.
Saint Vincent, Minnesota, 30th.
Fort Robinson, Nebraska, 17th.
Crete, Nebraska, 18th.
North Platte, Nebraska, 18th.
Mount Washington, New Hampshire, 4th, 5th, 6th, 13th, 30th.
Oswego, New York, 7th.
Rochester, New York, 30th.
Tiffin, Ohio, 6th.
North Lewisburg, Ohio, 6th.
Garrettsville, Ohio, 30th.
Wauseon, Ohio, 31st.
Yellow Springs, Ohio, 31st.
Erie, Pennsylvania, 21st.
Charlotte, Vermont, 30th.
La Crosse, Wisconsin, 31st.

TEMPERATURE OF WATER.

The following table shows the highest and lowest temperatures of water observed at the several stations; the monthly ranges of water temperature; the average depth at which the observations were made; and the mean temperature of the air:

Temperature of water for October, 1885.

Station.	Temperature at bottom.		Range.	Average depth, feet and tenths.	Mean temperature of the air at station.
	Max.	Min.			
	°	°	°		°
Atlantic City, New Jersey	66.0	54.1	11.1	11.4	55.8
Alpena, Michigan	60.3	37.0	23.3	12.6	42.5
Augusta, Georgia	68.5	58.0	10.5	10.0	59.8
Baltimore, Maryland	68.4	59.0	9 4	10.6	55.4
Block Island, Rhode Island	61.2	53.3	7.9	8.4	54.5
Boston, Massachusetts	57.8	50.1	7.7	20.3	51.0
Buffalo, New York	66.0	44.9	21.1	9.7	49.2
Canby, Fort, Washington Territory	63.1	53.9	9.2	15.7	55.1
Cedar Keys, Florida	82.0	65.6	16.4	8.4	68.8
Charleston, South Carolina	74.1	62.2	11.9	38.5	65.2
Chicago, Illinois	66.6	38.9	27.7	8.8	51.1
Chincoteague, Virginia	70.3	54.3	16.0	3.6	58.8
Cleveland, Ohio	64.0	51.1	12.9	14.0	50.1
Detroit, Michigan	64.9	46.5	18.4	25.8	50.0
Duluth, Minnesota	52.2	43.9	8.3	10.7	41.7
Eastport, Maine	51.7	49.4	2.3	17.2	47.9
Escanaba, Michigan	59.1	46.8	12.3	19.6	42.1
Galveston, Texas	79.5	63.0	16.5	12.8	69.7
Grand Haven, Michigan	66.3	44.7	21.6	19.0	45.8
Indianola, Texas	82.5	59.6	22.9	8.9	69.8
Jacksonville, Florida	79.2	66.2	13.0	18.0	67.6
Key West, Florida	85.1	75.0	10.1	17.8	77.8
Mackinaw City, Michigan	50.6	43.3	13.3	10.0	43.9
Macon, Fort, North Carolina	74.8	63.0	11.8	13.6	63.5
Marquette, Michigan	54.5	43.1	11.4	12.6	41.6
Milwaukee, Wisconsin	59.8	49.9	9.9	8.0	46.4
Mobile, Alabama	77.7	61.9	15.8	15.9	62.9
New Haven, Connecticut	66.4	52.6	13.8	10.6	51.6
New London, Connecticut					
New York City	65.0	57.0	8.0	18.8	54.5
Norfolk, Virginia	71.7	58.0	13.7	16.2	60.4
Pensacola, Florida	81.2	65.0	16.2	17.4	64.7
Portland, Maine	53.1	48.3	4.8	16.9	47.5
Portland, Oregon	65.0	53.4	11.6	49.5	50.0
Sandusky, Ohio	66.6	47.0	19.6	11.6	50.5
Sandy Hook, New Jersey	68.2	55.4	12.8	2.3	55.3
San Francisco, California	61.2	58.0	3.2	38.4	59.5
Savannah, Georgia	71.6	60.3	11.1	11.3	64.5
Smithville, North Carolina	72.6	61.5	11.1	11.0	62.1
Toledo, Ohio	67.4	47.9	19.5	13.5	50.3
Wilmington, North Carolina					

COTTON REGION REPORTS.

The temperature in all districts was decidedly below the normal. The rainfall was largely in excess in the eastern districts, while marked deficiencies occurred in the western districts. The report from the district of Wilmington has not been received.

The following table shows the means of the maximum and minimum temperatures, and the average rainfall for the several cotton districts, for the month of October, 1885, together with the averages for the three preceding years:

Temperature and rainfall data for the cotton districts, October, 1885.

Districts.	Rainfall.			Temperature.							
				Maximum.			Minimum.			Extremes for Oct., 1885.	
	Average for Oct. of three preceding years.	Average for Oct., 1885.	Departures.	Mean for Oct. of three preceding years.	Mean for Oct., 1885.	Departures.	Mean for Oct. of three preceding years.	Mean for Oct., 1885.	Departures.	Max.	Min.
	Inch.	*Inch.*	*Inch.*	°	°	°	°	°	°	°	°
New Orleans	2.72	1.23	— 1.49	82.7	73.6	— 9.1	62.3	50.3	—12.0	93	30
Savannah	1.95	3.56	+ 1.61	82.8	74.3	— 8.5	61.0	55.1	— 5.9	92	37
Charleston	1.89	4.83	+ 2.94	79.1	72.0	— 7.1	55.9	51.8	— 4.1	85	33
Atlanta	1.66	5.66	+ 4.00	77.9	67.4	—10.5	56.3	47 9	— 8.4	79	29
Wilmington	2.01			76.9			54.6				
Memphis	2.83	2.09	— 0.74	77.6	68.6	— 9.0	54.5	46.1	— 8.4	85	20
Galveston*	4.14	1.65	— 2.40	83.1	77.2	— 5.9	61.9	54.4	— 7.5	90	27
Vicksburg	3.59	1.19	— 2.40	80.7	72.2	— 8.5	58.3	48.8	— 9.5	82	31
Montgomery	1.58	1.67	+ 0.09	81.8	71.4	—10.4	57 9	49.8	+ 8.1	86	28
Augusta	1.51	4.91	+ 3.40	79.6	69.6	—10.0	56.8	48.9	— 7.9	83	22
Little Rock	2.37	1.01	— 1.36	77.5	72.0	— 5.5	52.5	45.7	— 6.8	90	10
Mobile	2.15	2.06	— 0.09	82.0	72.9	— 9.1	58.5	49.8	— 8.7	85	21

* Averages for two years only.

WINDS.

The most frequent directions of the wind during October, 1885, are shown on chart ii by arrows flying with the wind; they are also given in the tables of miscellaneous meteorological data. In the extreme northwest, upper Mississippi and Missouri valleys, and in the Gulf States they were mostly from the north and northwest; in the south Atlantic states they were northeasterly; in the Ohio Valley, lower lake region, and in New England they were from southeast to southwest; in the middle Atlantic states, upper lake region, Rocky Mountain districts, and on the Pacific coast they were variable.

HIGH WINDS.

[*In miles per hour.*]

On the summit of Mount Washington, New Hampshire, winds of fifty or more miles per hour occurred during the month as follows: 94, se., 14th; 90, s., 21st; 81, se., 13th; 77, w., 4th; 72, sw., 20th; 68, w., 11th; 60, n., 5th; 60, se., 3d.; 60, sw., 22d; 60, ne., 30th; 59, w., 10th; 59, sw., 29th; 56, se., 2d; 52, sw., 19th; 50, w., 18th.

Other stations reporting wind-velocities of fifty or more miles per hour are as follows:

Pike's Peak, Colorado, 60, w., 10th; 58, nw., 4th; 56, nw., 27th; 54, w., 14th; 52, nw., 30th; 52, nw., 29th.
Valentine, Nebraska, 52, nw., 4th.
Sandy Hook, New Jersey, 60, e., 13th; 50, e., 29th.
Cape May, New Jersey, 52, w., 4th.
Barnegat City, New Jersey, 52, e., 29th.
Kitty Hawk, North Carolina, 76, se., 29th; 53, se., 12th.
Fort Macon, North Carolina, 56, se., 12th.
Sandusky, Ohio, 54, n., 29th.
Cape Henry, Virginia, 52, e., 13th.
Fort Canby, Washington Territory, 56, se., 27th; 54, s., 29th; 53, s., 25th.

LOCAL STORMS AND TORNADOES.

Block Island, Rhode Island, 3d: a violent thunder-storm occurred at about 9.30 a. m., accompanied by hail and wind-squalls, of short duration, of from forty to fifty miles per hour. Considerable damage was done to out-buildings, fences, etc.

Narragansett Pier, Rhode Island, 3d: a heavy thunder-storm, accompanied by high, variable winds and hail, began at 9.35 a. m. and continued for about one hour. The high winds caused considerable damage, and a large number of telephones were destroyed or damaged by lightning.

Westwood, Bergen county, New Jersey: a tornado occurred at this place at 1.15 p. m. on the 4th. The cloud was funnel-shaped, and moved in a northeasterly direction. The path of the tornado was about six miles in length and its width about

five hundred feet, the shortest time in passing a given point being ten seconds. Five buildings were destroyed, entailing a loss estimated at $25,000.

Windsor, Alachua county, Florida: a tornado occurred at this place at 12 m. on the 11th. It moved in an east-northeasterly direction at the rate of forty miles per hour, destroying four buildings, and injuring several others during its passage.

Lane Park, Sumter county, Florida: a tornado occurred a short distance east of this place on the morning of the 11th. The tornado moved in a northeasterly direction, leaving a well-marked path, about one hundred yards wide, through the timber; the largest pine and cypress trees were torn up by the roots.

Captain Charles Haley, of the schooner "Genevieve," at Philadelphia, November 9th, from Charleston, South Carolina, reports the following:

On October 29th, at 10 a. m., when about thirty miles south of Frying Pan Lightship, was struck by a tornado aloft, which carried away the main and mizzen masts about twenty-feet below the cross-trees. The weather at the time was moderate, and the wind on deck did not exceed a five-knot breeze, the only indications of a change being a rain-squall from the northwest. Four hours after the tornado we had a gale from the west which continued twenty hours.

Philadelphia, Pennsylvania, 29th: a heavy thunder-storm began at 6.35 p. m., and continued for one hour. The peals of thunder, and the electrical display, were very unusual. Considerable damage was done by lightning in this city and in Camden, New Jersey All of the electric lights were extinguished, and telegraphic communication was rendered difficult.

NAVIGATION.

STAGE OF WATER IN RIVERS.

In the following table are shown the danger-points at the various river stations; the highest and lowest stages for October, 1885, with the dates of occurrence, and the monthly ranges:

Heights of rivers above low-water mark, October, 1885.

[*Expressed in feet and tenths.*]

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
Red River:						
Shreveport, Louisiana	29 9	1, 2, 3	3 2	24	0 7	2 5
Arkansas River:						
Fort Smith, Arkansas	22 0	8	4 2	16, 18	2 7	1 5
Little Rock, Arkansas	23 0	1	4 8	26 to 30	3 3	1 5
Missouri River:						
Yankton, Dakota	24 0	1, 2, 3	14 0	29,30,31	11 6	2 4
Omaha, Nebraska	18 0	1, 2, 3	6 5	9, 10, 11, 13	5 7	0 8
Leavenworth, Kansas	20 0	19	7 3	10,11,12	6 5	0 8
Mississippi River:						
Saint Paul, Minnesota	14 5	1,13,16, 17, 19	3 4	25	2 9	0 5
La Crosse, Wisconsin	24 0	1, 2	4 8	30, 31	3 7	1 1
Dubuque, Iowa	10 0	1	5 0	15 to 19	3 8	1 8
Davenport, Iowa	15 0	1, 2	4 7	18	2 8	1 9
Keokuk, Iowa	14 0	1	6 3	15 to 18	3 9	2 4
Saint Louis, Missouri	32 0	1	12 5	18	8 8	3 7
Cairo, Illinois	40 0	28	15 0	20	8 4	6 6
Memphis, Tennessee	34 0	1	9 5	22	5 0	4 4
Vicksburg, Mississippi	41 0	1	18 2	26, 27	4 9	13 3
New Orleans, Louisiana*	—3 0	1	—10 1	25,29,30	—13 7	3 6
Ohio River:						
Pittsburg, Pennsylvania	22 0	16	7 5	2, 3, 4	0 8	6 7
Cincinnati, Ohio	50 0	20	17 1	11, 12	3 9	13 2
Louisville, Kentucky	25 0	22, 23	7 7	11	2 7	5 0
Cumberland River:						
Nashville, Tennessee	40 0	31	5 2	1	0 9	4 3
Tennessee River:						
Chattanooga, Tennessee	33 0	31	15 5	12	2 0	13 5
Monongahela River:						
Pittsburg, Pennsylvania	29 0	16	7 5	2, 3, 4	0 8	6 7
Savannah River:						
Augusta, Georgia	32 0	14	17 8	11	6 1	11 7
Mobile River:						
Mobile, Alabama	.....	19	16 8	4	15 2	1 6
Sacramento River:						
Red Bluff, California	.....	1 to 21	0 4	22 to 31	0 3	0 1
Sacramento, California	.....	19 to 24	7 7	1 to 17, 26 to 31	7 5	0 2
Willamette River:						
Portland, Oregon	.....	29	3 5	20	0 3	3 2
Colorado River:						
Yuma, Arizona	.....	.....	.....	.....	.....	.....

* Below high-water mark of 1874 and 1883.

The observer at Nashville, Tennessee, reports that the first steamer of the season from the Ohio River arrived at that place on the 28th. At the end of the month navigation for the fall season was resumed.

The Tennessee River at Chattanooga rose about ten feet during the last two days of the month.

FLOODS.

Sanford, Florida: more than six inches of rain fell at this place on the 10th, flooding the greater part of the town and the lowlands in the vicinity. Considerable damage was done to railroads, highways, bridges, etc. Lake Monroe rose three feet during the storm.

Savannah, Georgia: the high easterly and northeasterly winds during the 11th caused a remarkably high tide, which swept over the adjacent lowlands, causing great damage to the rice crop. The water in the Savannah River reached a stage eighteen inches higher than at any time since the flood of August, 1881.

Reading, Pennsylvania, 17th: the recent heavy rains caused a break in the Schuylkill Canal, near Birdsborough, and resulted in the flooding of the adjacent farms, some of the fields being covered to a depth of three feet.

Burlington, Vermont: the heavy rain on the 21st caused a rise of five feet in the Winooski River. A temporary bridge, connecting Burlington and Winooski, was washed away, entailing a loss of $1,000.

Sharon, Mercer county, Pennsylvania, 23d: the recent heavy rains caused the Shenango River to rise to an unusual height, causing a large amount of damage to the property of the Sharon water company.

Harrisonburg, Rockingham county, Virginia: the heaviest rainfall for many years occurred on the 29th and 30th. All streams were much swollen, and several washouts occurred along the Valley Branch of the Baltimore and Ohio railroad.

Richmond, Virginia, 30th: a high stage of water occurred in the James River on this date, submerging wharves in the lower part of the city; no serious damage resulted.

Lynchburg, Virginia: the remarkably heavy rainfall of the 28th and 29th caused destructive freshets in the streams in this part of the state. Much damage was done to railroad tracks and bridges. Reports from Fredericksburg state the flood in the Rappahannock River at that place caused damage estimated at $10,000.

Charleston, West Virginia: the Kanawha River rose rapidly during the morning of the 31st, sweeping away a large number of loaded barges along the river in this vicinity, causing the loss of about 500,000 bushels of coal. The losses are estimated at $150,000.

HIGH TIDES.

Smithville, North Carolina: the unusually high tide on the 12th submerged the entire water-front of this place; a few stores were flooded.

Wilmington, North Carolina: the highest tide for ten years occurred on the 12th.

Washington City: the tide in the Potomac was unusually high between 7 and 8 a. m. on the 12th.

Cape May, New Jersey: an unusually high sea caused considerable damage along the water-front at this place on the 25th.

High tides were also reported, as follows:

New River Inlet, North Carolina, 10th, 11th, 12th, 29th, 30th, 31st.

Cedar Keys, Florida, 11th.

Fort Macon, North Carolina, 12th, 27th, 28th, 29th.

Chincoteague, Virginia, 12th, 13th.

Ocean City, Maryland, 12th, 13th, 29th.

New York City, 13th.

VERIFICATIONS.

INDICATIONS.

The percentages of indications verified for September, 1885, (which were not published in the REVIEW for that month), and those for October, 1885, will be published hereafter.